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The New "Proceedings"

Volume numbers are often somewhat mysterious; so far as we know, the Institute of British Foundrymen has published a volume of "Proceedings" each year since 1904, yet the total issued now amounts to 40! The 1946-47 "Proceedings" is somewhat belated owing to difficulties in the book-binding industry, yet it was worth waiting for, as its contents are particularly interesting. The Paper by the Qualcast technical staff on the subject of Ferrous Die Castings has aroused considerable interest in overseas foundry circles, especially in America. It is the outstanding contribution from this country on the technique of the Eaton Erb process. Now that the process of nodular cast iron has been published, metallurgists will re-read with added interest the Paper on "Graphite Formation in Grey Cast Iron" by Morrough and Williams. It "debunks" much work of Continental origin at one time very widely accepted. Despite austerity printing and paper, the photomicrographs used in this and other Papers emanating from the British Cast Iron Research Association rank amongst the best in current technical literature. Mr. P. H. Wilson's (the President's) Paper on the "Mass Production of Cast Steel Bomb Bodies" records a British wartime achievement which no country has ever yet surpassed. To make two steel castings of the complexity of a 500-lb. bomb every minute is indeed a noteworthy production. The two Papers on "Precision Investment Castings" have much enriched British technical literature, for, before their appearance, basic information was still scanty. There is still much work to be done before this system of making castings finds its established place in industry commensurate with the potentialities it discloses.

An outstanding contribution to the equipment and organisation of ironfoundries is the Paper by R. C. Shepherd. Never have the parameters of mechanised mould production been so clearly set forth. Lack of space prevents comment on the thoughtful contributions made by Mr. S. L. Finch and Mr. A. Cracknell and Mr. F. Cousans beyond the remark that a Paper by the latter pair disclosed that moisture did not strike back in skin-dried moulds—the contrary to opinion previously widely held. Amongst the Papers given before the branches, "Education in the Foundry," by Mr. John B. Longmuir, stands out from a good background as being an initial contribution to the "New Look" in the field of apprentice training.

In addition to the Papers, there are the Edward Williams lecture by Sir Edward Appleton and the Presidential Address, both of which provide a pre-war Lord Mayor's Banquet as food for thought. Mr. Wilson's address on modern industrial organisation and Sir Edward's pointers, as to where the latest scientific developments are likely to lead the foundryman, are well worth re-reading from time to time. The joint editors have displayed the Papers to good advantage and well maintained the high standard the "Proceedings" have long enjoyed.

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The Institute's London (1948) Conference Fund

Second List

Mr. C. H. Kain, the honorary treasurer of the Fund being raised in connection with the forthcoming conference of the Institute of British Foundrymen, has sent for publication the second list of subscribers, as under:—Foundry Trades' Equipment and Supplies Association, £59 2s.; Qualcast, Limited, £52 10s.; Morgan Crucible Company, Limited, £20; International Meehanite Metal Company, Limited, £15 15s.; Staff of Lake & Elliot, Limited, £10 10s.; Constructional Engineering Company, Limited, £10 10s.; Wm. Cumming & Company, Limited, £10 10s.; John Gardom & Company, £10; Fraser & Chalmers, Limited, £10; Babcock & Wilcox, Limited, £5 5s.; Thomas Butlin & Company, £5 5s.; Mr. E. A. Carlisle, £5 5s.; Indian Iron & Steel Company, £5 5s.; Southern Foundries (1926), Limited, £5 5s.; Burn & Company, Limited (Howrah), £5 5s.; Mr. Henry S. Clark, £5 5s.; John H. Clark & Company, £5 5s.; Haywood Foundries, Limited, £5 5s.; Davey Paxman & Company, Limited, £5; Sternol, Limited, £5; Suffolk Ironfoundry (1920), Limited, £5; Stuart Turner, Limited, £5; Kelly & Cleaver, Limited, £3 3s.; Dewrance & Company, Limited, £2 2s.; the Eyre Smelting Company, Limited, £2 2s.; Gillett & Johnston, Limited, £2 2s.; Dr. J. G. A. Skerl, £2 2s.; Barnards, Limited, £2 2s.; Barnard & Sons, Limited, £2 2s.; Mr. P. S. Eustace, £2 2s.; Mr. E. A. Baker, £2 2s.; Mr. James P. Dobbie, £1 11s. 6d.; Mr. C. J. Whitfield, £1 1s.; Mr. M. A. Parlanti, £1 1s.; Mr. Jean Paul Laurent, 10s.; Mr. R. W. Pollard, 10s.; Mr. G. Surtees, 8s. 6d. Total £291 3s. Previously acknowledged, £532 18s. 6d.; Grand total, £824 1s. 6d.

Forty Years Ago

The June issue of the *Foundry Trade* for 1908 detailed a unified system of costing for jobbing ironfounders, as recommended by [American] Jobbing Founders' Association. Printed blank forms were prepared for use by the members. It is so complete that only minor alterations would be necessary today! The death of Dr. Herman Wedding, the eminent German metallurgist was announced. Brightside Foundry Company had just completed the making of a 300-ton press. The oxy-acetylene process for welding and casting pipes was demonstrated in Cardiff. Dr. Sorby left £6,500 to endow a chair of Geology at the University of Sheffield. Amongst new companies formed was the Parker Foundry Company, of Derby.

ON THE OCCASION of the dance and cabaret to be held to-morrow week at the Café Royal, as part of the Annual Conference of the Institute of British Foundrymen, a presentation is to be made by the proprietors of the FOUNDRY TRADE JOURNAL to Mr. V. C. Faulkner to do honour to his election as president of the International Committee of the Foundry Technical Associations and his occupancy, for 28 years, of the Editorial chair of this JOURNAL.

Forthcoming Events

(Secretaries are invited to send in notices of meetings, etc., for inclusion in this column.)

JUNE 8, 9, 10 and 11.
Institute of British Foundrymen.
Annual Conference at the Café Royal, Regent Street, London, W.1. Detailed programme printed in the JOURNAL, April 15, 1948.

JUNE 8.
Institution of Production Engineers.
Wolverhampton Graduate Section:—Film Show, "Wheels Behind the Wheels," at the Walsall Technical College, at 7.15 p.m.

JUNE 10.
Institute of Vitreous Enamellers.
Midland Section:—Annual General Meeting, at the Chamber of Commerce, New Street, Birmingham, at 7.15 p.m., followed by "Bubbles," a Paper by H. Clarke.

Shortage of Cast-iron Scrap in Germany

According to the German press, the supply of cast-iron scrap is at the moment even worse than that of steel. There is a definite bottleneck. In normal times it was already very difficult to satisfy the demand in the home market. As a result, cast-iron scrap was imported, particularly from Britain, Holland, Belgium and partly from the U.S.A. That possibility no longer exists, not only because of currency restrictions, but because those countries themselves complain of a shortage. In Germany there are few machines going for scrap as many old machines have been put to work again. The position of the German scrap-iron market is further complicated by the fact that collecting is a low-rated job and poorly paid. It must be added, however, that the cast-iron scrap market particularly was generally supplied from the smallest sources. It is hoped that the currency reforms may revive the collecting of ordinary cast-iron scrap, such as the merchant grade and pots and pans, of which there must certainly be reserves in homes and among débris.

International Mechanical Engineering Congress

A *Congres International des Fabrications Mécaniques*, is to be held in Paris from September 13 to September 18, 1948. This will be the first International Mechanical Engineering Congress to approach the subject of development in the engineering sciences and manufacturing technique from the point of view of the industrialist. A number of Papers will be presented from experts in many countries, including four from Great Britain. In addition to the formal sessions, there will be a full programme of visits to industrial plants in the Paris area, and demonstrations of various industrial techniques. Further particulars regarding the Congress can be obtained from the Publications Division, the British Engineers' Association, 32, Victoria Street, London, S.W.1.

LAST FRIDAY, Mr. A. S. Beech, of the Foundry Equipment Company, Limited, gave a lecture on "Mechanical Aids in the Foundry" to the South African Branch of the Institute of British Foundrymen at Kelvin House, Johannesburg.

Foundry Production Control*

By W. A. Turner and A. K. Jeffrey

Detailed methods for Planning and Production applied to Foundry Layout and Organisation

It should be made clear at the outset that production control, as it is to be dealt with herein, is much more than the mere phrase itself suggests. It has a dual aspect—one of planning and one of control—and while control must follow after planning in practice, neither control nor planning is fundamentally the senior partner—they are of equal importance.

Definition

Fundamentally production control decides four things:—(1) What work shall be done; (2) How that work shall be done; (3) Where it shall be done; and (4) when it shall be done.

L. P. Alford has probably best described the underlying principle of production control as follows:—"The highest efficiency in production is obtained by manufacturing the required quantity of product, of the required quality, at the required time, by the best and cheapest method."

This of course is no more than foundrymen are all trying to do in their daily work, and it may well be asked how production control will help, that is, if one does not already use it. Briefly, production control should co-ordinate all the work of forward planning and standardisation of method, so that production workers of all grades can get on with their job of turning out castings.

Functions and Organisation

Having defined the broader objects of production control, this subject will be considered in more detail—its functions and its technique. There are twenty-three functions, and though apparently a formidable list, it must be remembered that they are only functions. They

*A Paper read before the London Branch of the Institute of British Foundrymen, Mr. E. M. Currie presiding. The Authors are partners in W. A. Turner, Jeffrey & Company, consulting engineers.

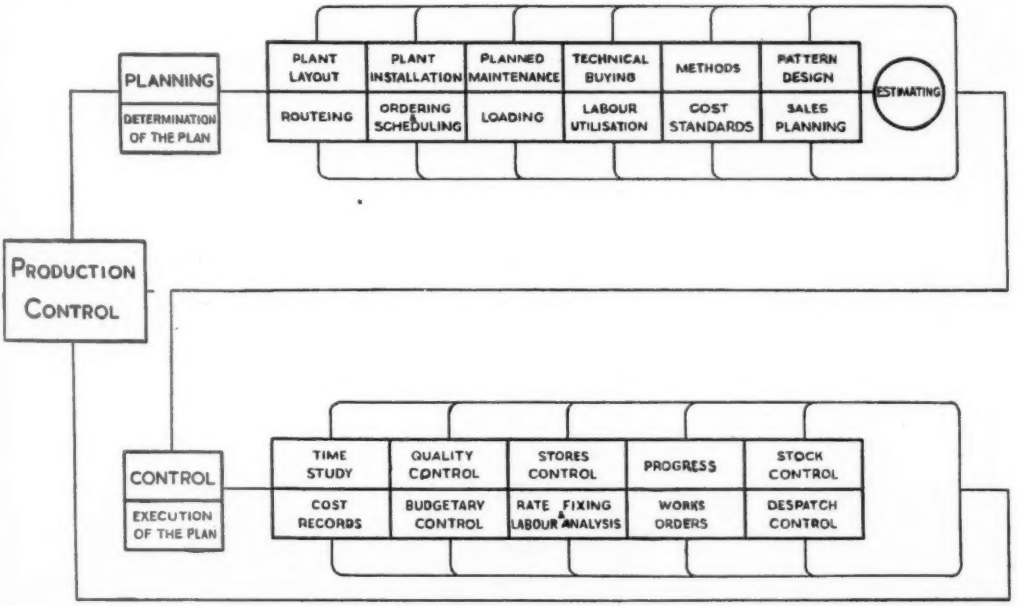

FIG. 1.—FUNCTIONAL ORGANISATION CHART.

Foundry Production Control

are not necessarily separate jobs, each to be carried out by a separate person, though of course they may be. That depends on the size of the foundry. They are all shown in detail in Fig. 1, and the split-up of planning functions and control functions, and their inter-relation, can be plainly seen. It will be noticed that on Fig. 1 the beginning of control as such is linked to the end of planning. This illustrates the point that control follows planning, *not* that control is subservient to planning—neither can exist effectively without the other—but when considering a particular order, control cannot start to operate until the planning is compleed. The Functional Organisation Chart is probably misleading in showing all the various functions as watertight compartments, which of course they cannot be. Every function depends on one or more other functions, and both planning and control are inter-dependent to an extent impossible to show on this chart.

The Technique of Production Control as it relates to a particular order is shown in Fig. 2. It is not so academic as the first chart, since it illustrates the actual work to be done after an order for a casting is received —and if the four postulates of production control are to be satisfied, this work must be done in any foundry, no matter what its size.

Staff: Scope and Limitations

This matter of carrying out the functions needs some amplification. They must *be* carried out, but the number of people employed in doing this will depend, as in every other department, on the size of the organisation. A large foundry may employ as many as a dozen or more, headed by a "planning manager" equal in status to the works manager—while in small units the general manager, or even the proprietor, will not only supervise the work but carry out a good deal of it himself. The "military" type of organisation—where authority stems from the top and passes downward in lessening degrees—is one with which everybody is familiar, and it is the most easily applied here.

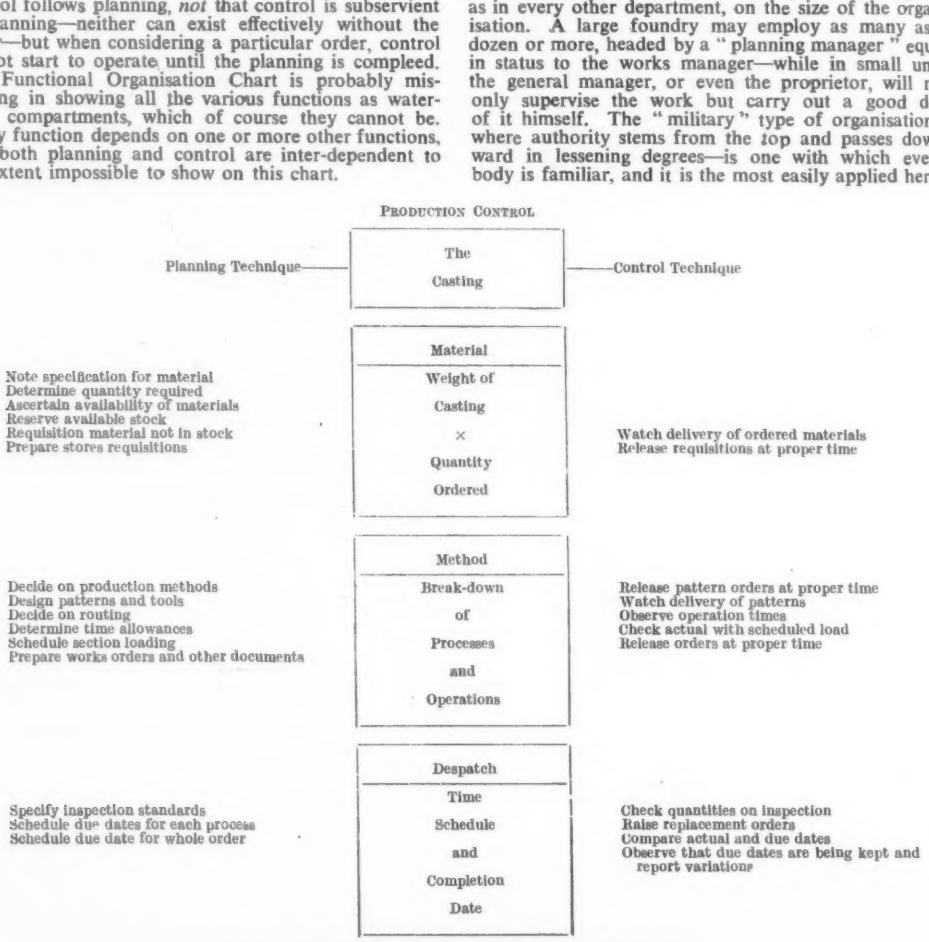

FIG. 2.—FOUNDRY PRODUCTION CONTROL TECHNIQUE.

The production control department, however, must not get ideas above its station. It is an "on-cost" in any organisation and must first of all measure its own efficiency. It must avoid the tendency to overburden itself with staff, and above all it should not be allowed to spend its time in amassing interesting historical data —of little practical value. There is another side to this, though, and that is, that a planner, if he is a good one, will demand a good salary. He should be allowed to earn it by applying his specialised knowledge to the skilled work he is capable of doing. Routine listing and checking can be adequately carried out by female clerks and they are not part of the planner's work.

Not only each type of works, but each foundry, demands a system different in some respects from other foundries. The production control system has to be devised for each foundry according to its particular needs: it cannot be transferred bodily from another foundry; therefore any examples given here are only by way of illustrations, and not recommendations for standard practice. Also, the systems laid down should always be reviewed critically, since changes in conditions—such as the transition from a seller's to a buyer's market, or an alteration in labour availability, will demand changes in the production control system.

The next logical thing to discuss would be the planning of a new foundry from a green field, but the possibility of this happening is so remote—at any rate in the London area—that it is best forgotten for the time being. However, many foundrymen must be, or have been, considering cheapening or increasing their output by means of re-organisation, so it is proposed to consider the matter from that angle; the differences between planning from scratch and planning a foundry re-organisation are not great, since the aims in both cases are the same—it is only that the limitations are greater in the latter case.

Layout and Flow

It has been said—probably by Alford—that "Lay-out is an expression of a purpose." Once the purpose —that is, the work to be done by the foundry—has been established as exactly as possible—then its best means of pictorial representation is the process flow sheet. This sheet is the starting point of all lay-out since it should show all the processes and—what is

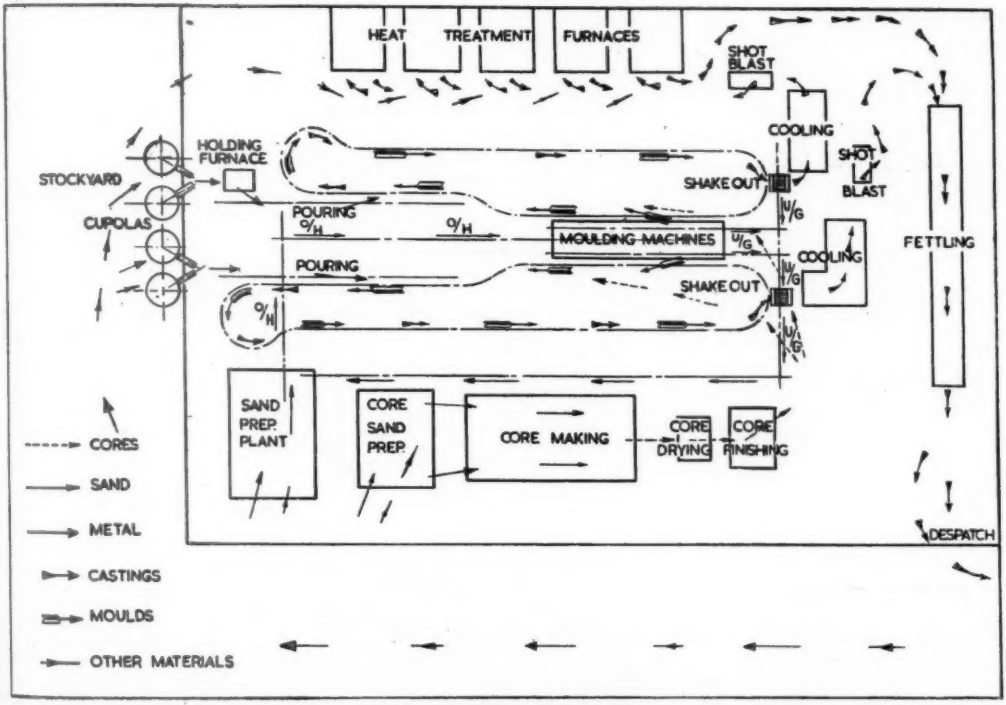

FIG. 3.—PROCESS FLOW SHEET.

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more important—all the movements, to be included in and accomplished by the lay-out. It does not indicate *how* the work is to be done, but *what* work is to be done—all the actual jobs that have to be carried out to produce the type of casting required. The example on Fig. 3 is of a foundry for the production of machine-moulded grey- and malleable-iron castings with all their attendant processes. Apart from the use of this process flow sheet as an essential part of the basis for planning, its main point of interest in this case is that it is designed round the use of a single moulding sand for all types of casting.

The purpose the Authors desire to express has been laid down. They now have to find its best means of expression. Limitations have been mentioned. What are these limitations? Is there, as in most cases, a capital limitation, or, as there generally is to-day, a labour limitation? If so, of what type of labour—skilled or unskilled, male or female? Or, as in the case of an automobile foundry, is the problem to reach a stipulated production in a specified area, irrespective of capital outlay? It may be any one of these; but generally, of course, it is a combination of two or more. The answers to these questions are all-important, since on them depends the next step—the preparation of the production flow chart. This, although sketchy, is the first glimpse available of the foundry as it will finally take shape, and as its name implies, it brings up the consideration of flow—a commodity which in the foundry is probably more discussed in theory and ignored in practice than any other. Everybody has seen examples of bad flow—in other people's foundries, of course—and the ultimate effect of it in cost to the industry is so great that it must be eliminated where possible.

The aim should in all cases be straight-line flow with feeders. This is not always wholly possible—in reorganisation schemes very rarely so—but crossed lines of flow on the same level should be avoided like the plague. In foundries there are the advantage of cranes for overhead transport, and one of the main raw materials—sand—can easily be moved by belt conveyors at high level or underground, so, by using these different levels, there is a little more flexibility than appears at first. The production flow chart (Fig. 4) is developed from the process flow sheet shown in Fig. 3, and it demonstrates very well just how it derives from the process flow sheet. It will be seen that there appear to be crossed lines of flow into and out of the heat-treatment furnaces, but the loading and unloading of these are intermittent operations—not continuous ones—and they can be so planned that they do not take place simultaneously.

Detailed Layout

The stage has now been reached where the broad principles of layout-planning are left, and the practical choice and disposition of plant and machinery enter

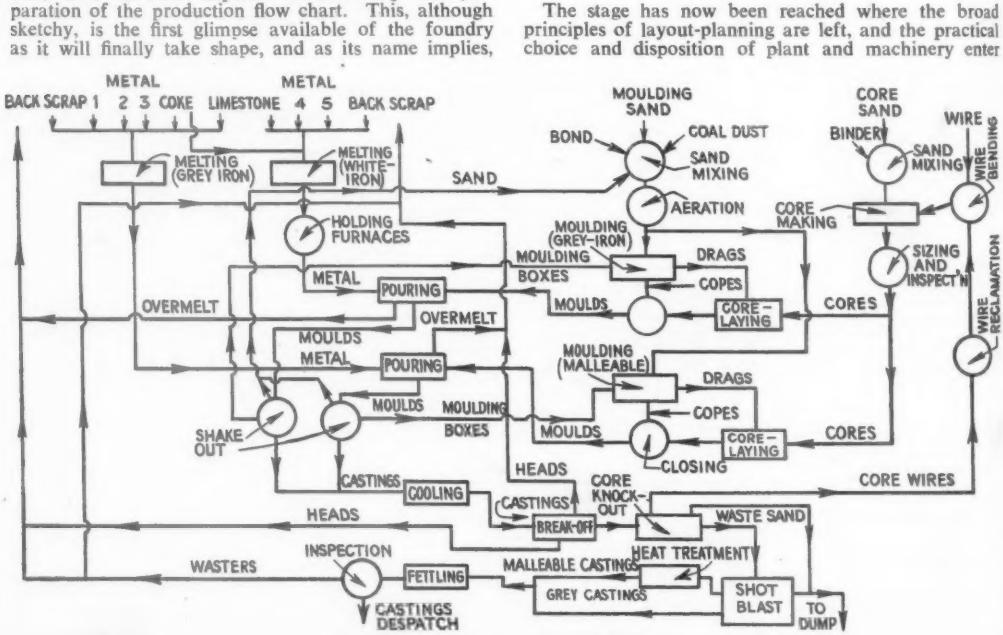

FIG. 4.—PRODUCTION FLOW CHART.

into consideration. The size of the building becomes of paramount importance, also the breakdown of the layout, plant capacities, the choice of plant—from the point of view of its flexibility as well as economics—and its suitability for the work which may have to be done in five years' time as well as for the job to be turned out next year.

In plant layout two-dimensional templates of machines, or "butterflies," are of great assistance, but in a large scheme, three-dimensional models are most satisfactory. Their cost is not negligible, but it is more than covered by the cost of the mistakes they save. Materials-handling plant particularly must receive the greatest attention—it is not the hand processes in a hand-moulding shop which are costly, but the number of times large quantities of heavy material have to be handled.

Plant Capacities

When considering plant capacities, it is generally true to say that the actual flow is very nearly the same for all products within a scheduled range. Therefore, the capacity of the production machines—moulding machines, core blowers, fettling plant—can all be based on averages, but the capacity of the plant for feeders—sand mills and cupolas, for instance—has to be based on maxima to provide for peak demands. Fig. 5 shows how the average production of a range of moulding machines is assessed. From it the amount of sand and metal required per unit of time are given, and to these amounts are added a reasonable allowance to cope with surges, and the required capacity of the sand mills or cupolas is known.

Equipment Selection

The economics of equipment selection are not by any means an unknown or incalculable quantity, although they are often regarded as such. There have been many formulæ devised to guide us in this matter, but probably one of the simplest, yet most accurate, has been propounded by T. H. Burnham. The graph (Fig. 6) arising from it shows how a comparison can be made between production by hand methods and by two different types of machine.

There is another point to be kept in mind here. Not only has the cost of the machine to be considered, but also the cost of any ancillary equipment which may be needed to bring it up to its full efficiency. Fig. 7 shows a case in point. The Sandslinger itself costs roughly £1,500, but the sand hopper, roller track, castor table and turn-over stripping machine will increase this by at least 100 per cent.

Good layout planning cannot, of course, be as rigid as these bare notes have made it sound. All foundries, whether they are jobbing shops or whether they are repetition foundries attached to larger works, have to consider possible changes in output, and a certain flexibility must be allowed to cater for these changes. Expansion and development, too, have to be kept in mind, and some allowance made for them when designing buildings and laying out plant. Everybody is familiar with foundries which are just a melée of

Sta. No.	Machines.	Box sizes.	Boxes per hr. 75 per cent. eff.	Av. yield per box.	Yield tons per week, 40 hrs.	Idle time allowed.	Cub.cap. of box.	Sand consumed. Cub. ft. per hr.	Sand consumed. Tons per hr.	Remarks.
					Tons.	Per cent.	Cub. ft.			
1	RD. 5	t/o 48 in. by 30 in. by 10 in.	7	2 cwt.	28	—	20.6	145	7.25	Pattern changes outside the 40-hour week.
2	RD. 5	t/o on 15 in.								
3	RD. 5	t/o 40 in. by 27 in. by 10 in.	12	1¼ cwt.	30	—	12.5	150	7.50	
4	RD. 5	t/o on 10 in.								
5	WT. 5620	t/o 21 in. by 18 in. by 14 in.	28	40 lb.	15	25	4.4	123	6.15	25 per cent. machine time allowed for pattern changes.
6	HPL. 2	s/d on 6 in.								
7	HPL. 2	s/d 21 in. by 16 in. by 8 in.	36	24 lb.	11½	25	3.1	112	5.60	
8	WT. 562C	t/o on 8 in.								
9	HPL. 2	s/d 26 in. by 16 in. by 5 in.	36	23 lb.	15	—	2.9	105	5.20	
10	HPL. 2	s/d on 7 in.								
11	HPL. 2	s/d 16 in. by 14 in. by 5 in.	60	14 lb.	15	—	1.3	78	3.90	
14	HPL. 2	s/d on 5 in.								
12	HPL. 2	s/d 19 in. by 14 in. by 6 in.	48	18 lb.	15½	—	1.9	91	4.55	
15	HPL. 2	s/d on 6 in.								
13	HPL. 2	s/d as for stations 9, 10,	—	—	—	100	—	—	—	Spare stations to allow for pattern changes on stations 9-16.
16	HPL. 2	s/d 11, 12, 14 and 15								
17	Pneu. 4000	t/o 66 in. by 40 in. by 10 in.	4	5 cwt.	40	—	38.0	152	7.60	Pattern changes outside the 40-hour week.
18	Pneu. 4000	t/o on 15 in.								
										Net total hourly consumption of sand: Tons 47.75

FIG. 5.—CAST IRON MOULDING SECTION—PRODUCTION CAPACITY TABLE.

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unco-ordinated sections, where flow is practically non-existent, where efficiency is poor—merely because what planning has been done has been on a short-term basis and has not taken account of the possibilities and needs of the future.

Detail Planning

So far the Paper has covered this business of planning only on the broadest basis—the provision of plant and equipment for such operations or processes as are common to large groups of castings in the range for which we are planning. Hitherto this thesis has been planning for production—but the stage is now reached for the planning *of* production itself—the detailed planning of an order for a specific casting, in which one has to consider separately such things as production breakdown, metal specification, batch size, methods, machine or labour availability.

CONSIDERATION OF A MACHINE COSTING £C.

LET i be rate of interest and insurance
d be rate of depreciation
r be rate allowed for repairs
P be annual cost of power
Assume that the machine works 250 days per year
Then the daily charge on the machine is

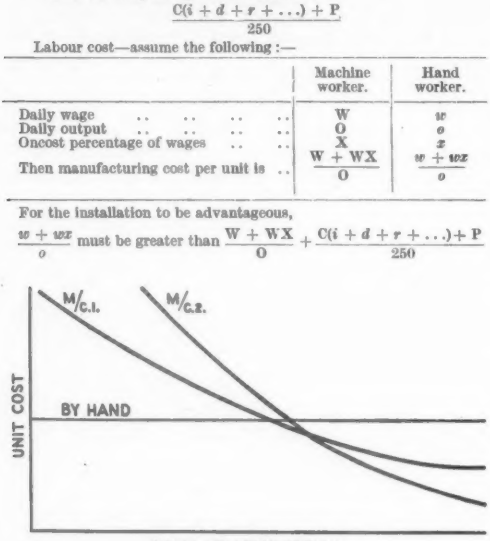
$$\frac{C(i + d + r + \ldots) + P}{250}$$

Labour cost—assume the following :—

	Machine worker.	Hand worker.
Daily wage	W	w
Daily output	O	o
Oncost percentage of wages	X	x
Then manufacturing cost per unit is ..	$\frac{W + WX}{O}$	$\frac{w + wx}{o}$

For the installation to be advantageous,

$$\frac{w + wx}{o} \text{ must be greater than } \frac{W + WX}{O} + \frac{C(i + d + r + \ldots) + P}{250}$$



HAND v. MACHINE PRODUCTION.
EFFECT OF QUANTITY ON UNIT COST.

FIG. 6.—BURNHAM FORMULA AND GRAPH.

Acknowledgments to T. H. Burnham, "Engineering Economics."

Batch Size

One of the problems requiring the most painstaking thought is the batch size—particularly in those foundries where they can tackle the same casting by either hand or machine moulding methods. In such foundries nearly every function of planning will depend on this question—methods, type of pattern equipment, machine loading, routing—all of them are affected by it, and if a saving to the foundry can be shown by a larger batch size than the order calls for, the planner must tell the sales department. A customer can usually be induced to take a two-monthly batch of 200 castings instead of a fortnightly batch of 50 if he can be shown a saving in price. Another point which will regain prominence when the buyer's market in castings returns, is that it is much more important from the point of view of economy—to keep a machine moulding department working at peak production than a hand moulding shop.

This is not to say that the maximum batch is the most economic, neither is it always the most suitable. Foundry work is a complex matter and when considering the optimum batch size from the point of view of two different departments, it is possible to get two entirely different results. For instance, the best batch size for a certain casting in the moulding shop might be 500 pieces. If the coring be particularly complex, however, it may be uneconomic or even impossible to store 500 sets of cores. Again, it may be impossible to provide metal at the rate that moulds can be turned out. These are all situations that demand compromise and an intimate knowledge of the foundry concerned. For this reason it would be unwise to lay down hard-and-fast rules, but of the five bases of consideration—that is, moulding, melting, core-making, fettling and rate of consumption—it is generally best initially to consider moulding.

Metal

The next consideration in the planning office is that of metal: the metal mixture or alloy has to be considered in relation to the stock position. If the specified alloy is in stock, then the necessary quantity should be reserved. If not, then provision should be made for its purchase or for the purchase of the alloying constituents. The metallurgist's advice must be sought as to any difficulties or peculiarities inherent in the metal specified. Sometimes, where the ultimate purpose of the casting is known, the metallurgist may be able to give useful advice as to the possibility of using a cheaper metal or one more easily obtainable.

Production Breakdown into Elements

Before the best method of manufacture can be established, a production breakdown into elements has to be carried out. This involves the splitting up of a process into operations and, if necessary, the breaking down of operations into elements. This will apply, too, in those departments devoted to hand operations, as well as in the mechanised shops. In these days of skilled labour shortage, one of the main jobs of the foundry planner has been to conserve the particular ability of the

skilled man—in other words, to eliminate from his work operations or elements which lower-grade labour can do satisfactorily. One of the results of this has been an insistence on large batch sizes, which is not by any means a complete answer. Fig. 7 shows an alternative way of tackling the problem of increasing output from a large variety of small hand-moulding patterns, where the increased quantities do not warrant machine moulding, and where the patternshop has not the capacity to mount the patterns on plates quickly. The only preparation required is the making of a plaster odd-side for each pattern.

Briefly, the elements of the operation are that an odd-side, pattern, and box are assembled and sent along the roller track to the Sandslinger—the box is rammed, then the complete assembly passes to a machine for turning over and stripping the odd-side from the pattern. The joint is cut, the mould dusted, the cope box placed on the drag mould, and the cope is then rammed by the Sandslinger. The mould is then opened and the pattern drawn, after which the mould is finished, covered up, closed and sent on its way to the pouring station, while the pattern and odd-side go round again or are withdrawn. One can easily distinguish the three skilled men, and it will be agreed that they are doing nothing but the more highly skilled elements of the operations, leaving the other work to be done mechanically or by lower grade labour. It will be appreciated that this system offers considerable flexibility since any batch size from any number of patterns can be produced without time lost in pattern changes.

FIG. 8.—BOMB FRAME CASTING.

Detail Flow

The question of flow in general has already been dealt with, but in some cases the results arising from the production splitting-up may have an influence on it. For instance, in considering a particular job, it may be found that the best sequence of operations will give a bad flow. In the example shown in Fig. 8, the bar at the top of the casting was not part of it, but was put in to prevent distortion during heat treatment and was removed before the casting went to the stores. Now to have sent that casting back to the saw benches after heat treatment would have involved a bad flow, for one thing, and the possibility of confusion between heat-treated and un-heat-treated castings for another, so the decision was quite rightly taken to instal another band saw, located between the heat treatment and the stores so that no reverse movements were involved.

(To be continued)

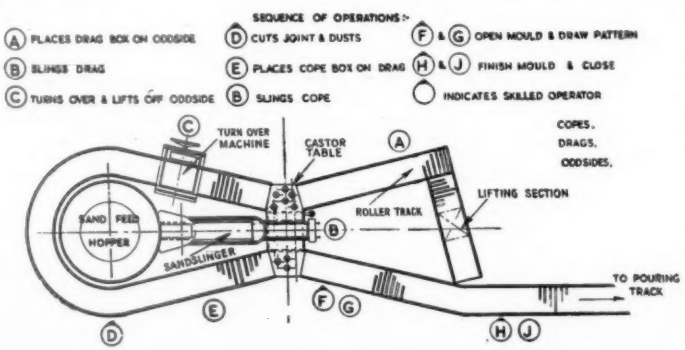


FIG. 7.—SHEPHERD'S CROOK LAYOUT USING SANDSLINGER.

International Meehanite Research Institute

Annual Meeting in Birmingham

The sixteenth Annual Conference of the Meehanite Research Institute was held in the Grand Hotel, Birmingham, on May 25, 26 and 27, when there was a record of almost 100 members, representing 40 licensee firms, assembled under the chairmanship of Mr. Oliver Smalley, O.B.E., President of the Institute. The members attending included 20 representatives from licensees in France, Belgium, Holland, Italy, Norway, Sweden and Denmark. As usual, the first day of the Conference was taken up with meetings of the board of directors of the Institute and the standing committees.

The CHAIRMAN, in the course of a short address, explained that the object of the conference was the discussion of matters in connection with the advancement of Meehanite interests, and the successful production of castings to meet customers' requirements. It was also essential to study the results of research; but it had to be remembered that in the final analysis, the main objective of the members had to be the production of of high-quality castings.

The SECRETARY, in presenting the annual report, pointed out that progress during the year had been considerable, the number of new licences granted had been larger than usual, several of the Continental licences had been renewed and there were quite a number more new ones being negotiated. The position of the Institute was therefore very satisfactory.

The TREASURER, in his report, showed that the financial position was good, and the funds available for research were increasing. Reports submitted by the chairmen of Research, Education and Training, Advertising and other Committees indicated that considerable progress had been made during the past year.

The meeting received a special report upon the activities of the Meehanite Training School, from which it was evident that the facilities available were being fully taken advantage of, whilst the results had been eminently satisfactory. The two best boys were attending the meeting.

Technical Papers

The meeting then proceeded to the discussion of about 25 Papers and Technical Research Reports..

Among the subjects upon which reports were presented and discussed were:—The marketing of Meehanite castings in the abrasion resisting field; Waste in the foundry; Cost and production control; Economies in the foundry; A study of the resistance of Meehanite to surface heat cracking; Induction hardening of Meehanite; Ideas for Meehanite foundries; Impact tests on white and wear-resisting irons; A consideration of the merits of the various charging systems for cupolas to ensure uniformity and control; Hot toughness of sands and relationship to buckling; Flowability of moulding sands; Further experiments on the Currie fluidity test; Transverse testing of Meehanite beams; Cleaning of casting by Hydroblast; The hardness of Meehanite at elevated temperatures; The influence of silicon on the sub-critical austenitic transformation of Meehanite; The effect of annealing below the critical on the hardness and strength of Meehanite; and Methods of fly-ash and smoke abatement from cupola stacks.

The forenoon of the second day was devoted to a special metallurgical session for the presentation and discussion of certain reports of special interest to the metallurgists, over which Mr. E. M. Currie presided. There were also sessions for the consideration of publicity matters and of advertising interests under the chairmanships of Mr. W. H. Harper and Mr. N. E. Rambush respectively.

Annual Dinner

The annual dinner of the Institute was held on the evening of the second day of the Conference. Mr. J. Cameron, senr., occupied the chair, supported by directors of the Institute, together with a number of important guests, including Mr. V. C. Faulkner, Editor of the FOUNDRY TRADE JOURNAL, and representatives of engineering, paper machinery, shipbuilding, machine tool and chemical industries in Norway, Denmark and Sweden.

The CHAIRMAN, in an entertaining speech, welcomed the guests and reminded the company that he had for 10 years been privileged to preside at the Annual Dinner. He reviewed the progress from small beginnings to the present large assembly.

The toast of the Meehanite Research Institute, proposed by Mr. Ralph Blakeborough, was replied to by Mr. Oliver Smalley in a brief but jocular speech, which concluded with a desire to see the Institute continue its successful career for many years to come. "The Guests" was proposed by Mr. R. B. Templeton, president-elect of the Institute of British Foundrymen, in an entertaining but carefully phrased speech expressing the pleasure that all the members felt in having so many distinguished visitors present.

MR. V. C. FAULKNER said that the publicity issued by the Meehanite group was so good that some engineering concerns mentally associated the word with high-duty cast irons to the exclusion of all others. However, to assure the continuation of this attitude, propaganda must continue until it occupied the same position in the ironfounding industry as Nylons did in hosiery wear.

MR. S. MANSTED, of Atlas Maskinfabrik, Denmark, also responded for the guests in an interesting and amusing speech, in which he stated how impressed he had been with the proceedings of the Institute's meetings and the amount of knowledge available. He was attending as a guest, but hoped he would be able to attend as a fully attested member next year.

MR. E. M. CURRIE, in proposing a vote of thanks to the chairman, gave a brief account of the progress of the Institute and the outlook for the future. He was sure that everyone would wish that Mr. Cameron might continue to preside for many years to come.

The final afternoon of the Conference was devoted to a visit to the foundries of John Harper (Meehanite), Limited, at Willenhall, on the invitation of the directors of the company. At the conclusion of the visit MR. J. E. O. LITTLE proposed a vote of thanks to their hosts.

Correspondence

[We accept no responsibility for the statements made or the opinions expressed by our correspondents.]

BRITISH SAND RESOURCES

To the Editor of the FOUNDRY TRADE JOURNAL.

SIR,—As a result of recent experimental work on moulding sands, we have arrived at what we regard as desirable properties. These are obtained at present by combining two raw sands and a pulverised clay, and close control is therefore essential.

The use of one raw sand having the desired properties would obviously be a great advantage as regards both handling and control, but finding this sand is proving rather difficult. Boswell is more or less out of date and no classification of sands exists, the suppliers being rarely conversant with the properties of the materials which they sell.

With the increasing knowledge of sand technology, more and more foundries must be facing this same difficulty and it would be a great service to the industry if the Institute of British Foundrymen or some other organisation could carry out a survey of existing sand quarries, and record a few of the more important properties. There would be a considerable amount of work attached to this, and unworked deposits could be left to a later date.—Yours, etc.,

ARCHIBALD JAMIESON.

The Argus Foundry, Limited,
Thornliebank, near Glasgow.
May 19, 1948.

[Much work on this subject was carried out during the war under the auspices of the Iron and Steel Institute by Davies and Rees.—EDITOR.]

GREY LOW-SILICON CAST IRON

To the Editor of the FOUNDRY TRADE JOURNAL.

SIR,—Mr. K. H. Wright, discussing nodular iron, mentioned an antique cannon of composition: Total carbon, 3.88; combined carbon, 0.68; Si, 0.25, etc., and said: "Such an iron, in a 1-in. section, would nowadays be mottled, although his examination showed it to be grey. Some such element as Mg, Ca or Ce must have been present." On the other hand, if the founders used a mould preheated throughout to 400 to 500 deg. C, the iron would be bound to be perfectly grey in all save any very thick parts, where it would be white in the centre of the section, because a truly preheated mould affects a low-silicon iron in an exactly opposite way to the action of a chill on a medium-silicon iron in an ordinary mould.—Yours, etc.,

HORACE J. YOUNG.

15, Lansdowne House,
Manchester, 20.
May 24, 1948.

MR. ROLAND W. PLUMTREE, of Australia, is visiting Britain to obtain Agencies for British Manufacturers of automatic parts, cycle accessories and household electrical appliances. London address: c/o Bank of New South Wales, 47, Berkeley Square, London, W.1.

New Catalogues

Crucible Furnaces. The Morgan Crucible Company, Limited, Battersea Church Road, London, S.W.11, in a new 12-page booklet covering their standard range of crucible melting furnaces, have used for the front cover a composite picture. This shows a number of furnaces in operation. The reviewer confesses to a prejudice against any composite picture, a view not universally, but still fairly widely shared.

The phrase "Thermal Efficiency" has been wrongly used, and "melting data" is the more correct expression for the figures disclosed in this connection. Beyond these mild criticisms the reviewer has nothing but praise. He is specially appreciative of the way in which essential data are presented. They are very largely taken in with the letter-press, which makes for easy assimilation. The illustrations have been as well chosen as they have been clearly reproduced.

Core Binder. Lambeth & Company (Liverpool), Limited, Greenock Street (off Paisley Street), Liverpool, 3, have just issued an 8-page booklet covering the potentialities and uses of "Totanin," a core binder. The covers are in black with the inscription picked out in gold, making an effective combination. Amongst the important claims made for this core binder, which is not based on linseed oil, is freedom from fumes. The material is water soluble.

Shop Lighting. Philips Electrical, Limited, of Shaftesbury Avenue, London, W.C.2, have sent us publication No. A.165, giving detailed information about industrial lighting fittings for tungsten lamps. Concentrating, dispersive and diffuser types are listed, and also an elliptical angle reflector for side and vertical surface illumination. Distribution curves and suspension details are included. All the fittings illustrated are made from heavy-gauge sheet metal and, where applicable, to British Standard Specifications.

House Organs

Z.D.A. Abstracts. April. Published by the Zinc Development Association, Lincoln House, Turl Street, Oxford.

With this issue there comes the Index for 1947. This latter serves to stress the size and importance of the literature being built-up around die castings. It is obvious that this branch of the foundry industry is being well served by the Zinc Development Association.

The Craven Machine Tool Gazette. Published by Craven Brothers (Manchester), Limited, Vauxhall Works, Reddish, Stockport.

Designed to interest users of machine tools, this magazine is outstanding for the excellence of its illustration and lay-out. A note as to the economic re-use of patterns is a matter worthy of more consideration than is usually given to the subject.

Notes from the Branches

Wales and Monmouth

The 24th Annual Meeting was held at the Engineers' Institute, Cardiff, on May 8. Mr. W. H. Thomas, Branch-President, welcomed Mr. V. C. Faulkner, who had travelled from London at short notice to deputise for Mr. T. Makemson, M.B.E., who was unfortunately unable to travel. Having approved the minutes of the last meeting and the auditors' report, the election of Branch officers was carried through, and the following are to take office:—

As Branch-President, Prof. W. R. D. Jones, D.Sc., University College, Cardiff.

As Senior Vice-President, Mr. Herbert Cole, Warwill Foundry, Abertillery, Mon.

As Junior Vice-President, Dr. Bryn Jones, D.Sc., Whitehead Iron & Steel Company, Limited, Newport, Mon.

As Members of the Branch Council: Mr. W. L. Tompkins, Mr. Gordon Jones, Mr. J. Masson, Mr. R. Gould, and Mr. G. McKinlay.

As Delegates to the National Council: Mr. R. G. Williams and Mr. H. B. Fisher.

As Technical Committee Representative: Dr. Bryn Jones, D.Sc.

As Branch Auditors: Mr. W. S. Kinsman and Mr. R. G. Williams.

As Honorary Secretary and Treasurer, Mr. A. S. Wall.

Mr. W. H. Thomas outlined the year's work during his period of office, which included some very excellent lectures and two works visits. The introduction of a short Paper competition had been moderately successful and the quality of entries most encouraging. He looked forward to a better response next time.

Thanking the members and the Branch Council for their support during his term of office, he wished Prof. Jones every success in the coming year.

Prof. W. R. D. Jones, in acknowledging his election to the office of Branch-President, expressed the opinion that this position should be occupied by a member engaged in the industry. There was, however, another view to be considered and that was one's willingness to accept responsibility in the conduct of branch affairs. He would look forward to his year of office with pleasure, depending upon the support of the members to make it a success.

Mr. W. S. Kinsman proposed a vote of thanks to Mr. W. H. Thomas for his work as Branch-President during the past year. The members had enjoyed an interesting programme of lectures and works visits and the branch had made progress, as was shown by the decision to open a section in West Wales. Mr. E. J. Kelly seconded, the vote being carried with applause.

Mr. V. C. Faulkner then presented prizes to winners of the Short Paper Competition:—

1st Prize: Mr. C. Badcock, "Steel Castings by the Centrifugal Process."

2nd Prize: Mr. J. Greatrex, "The Control of Foundry Progress."

(*Concluded at foot of column* 2.)

3rd Prize: Mr. W. R. Robatham, "Training of Foundry Apprentices."

In the course of his remarks, Mr. Faulkner said he was quite sure that the work put into the preparation of their Papers would prove to be of more benefit to them than the prizes they were now receiving.

Core Grids or Bars?

By "Tramp"

To reinforce cores, resort is made to either cast-iron grids or wrought-iron bars. For many jobs, the choice is just a matter of convenience, but occasionally, to ensure success, it is essential that one or the other be definitely specified depending on the nature of the job.

In cases where a cast grid may cause restriction to the free venting of the core, bars should be used, but in cases where a core has to withstand fluid pressure, grids are better. A particular case illustrating the latter is shown in Fig. 1, which is a special cast iron roller required to be free from surface blemish and of even section throughout, because much machining has to be carried out on the periphery.

The order called for a considerable number of these castings and they were produced horizontally in green-sand. Because of the comparatively small diameter of the core outlets, and because the job was of a repetition nature, the coremaker decided on wrought iron bars for the stiffening medium. The first batch of castings had a tendency to be thin on top as if the core had "floated," but closer examination revealed that the core had buckled. As no chaplets or studs were permitted, subsequent castings were produced with the cores made on a light section cast-iron grid. Being more rigid, this grid prevented the core from buckling and the rest of the batch were produced successfully. When a light pattern of the grid was made and fastened to a board it was an easy matter for a considerable number of the grids to be moulded on the grid bed and cast when convenient.

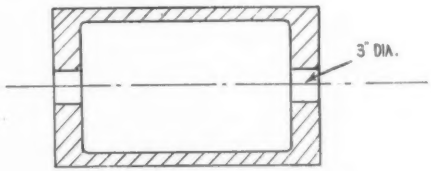


FIG. 1.—CAST-IRON ROLLER.

THE ENGINEERING RESEARCH STATION at Abington Hall, near Cambridge, of the British Welding Research Association was recently inspected for the first time by a representative group of members. The property was purchased in 1945.

Law Report

Fumes from an Aluminium Works

The First Division of the Court of Session, Glasgow, has refused a reclaiming motion by the North British Aluminium Company, Limited, against a decision of Lord Birnam allowing proof in a petition for interdict against the company by the Ben Nevis Distillery (Fort William), Limited, and Joseph William Hobbs, managing director of the distillery company and tenant-occupier of Inverlochy Castle and policies.

The petitioners seek interdict against the Aluminium Company from carrying on the manufacture of aluminium at Fort William in any manner whereby noxious vapour may be caused to pass over the lands of the petitioners to the damage of the vegetation and stock. The respondents deny the nuisance and contend that they are taking remedial measures, at a cost of over £500,000, chiefly to eliminate the fumes.

The Lord President (Lord Cooper) said that the respondents hoped to complete modernisation of their plant by 1950, an estimate dependent upon industrial conditions. They anticipated that as a result emission of fumes would be negligible and that, if this were not successful, they would try other means. The motion now made by the respondents, that the proceedings should be sisted, or the petition dismissed as unnecessary, was admittedly unprecedented. His Lordship was not prepared to propose any such course. In particular he was strongly opposed to the suggestion that they should deny to the petitioners the right of proving their admittedly relevant averments, but allow to the respondents a limited proof of certain allegations in their defences.

Lords Carmont and Russell concurred.

Tin Prices Increased

The Ministry of Supply has announced new buying prices for Malayan tin metal and Nigerian tin concentrates. The buying price for Malayan metal is increased from £504 to £554 per ton, ex smelters' works (Penang or Singapore), and the buying price for Nigerian tin concentrates from £485 10s. to £535 10s. per ton of tin in ore, f.a.s. Nigerian port. The selling price of Malayan metal is raised from £505 10s. to £555 10s. per ton, ex smelter (Penang or Singapore). The new prices came into operation on Tuesday and will remain in force until further notice.

The Ministry also announced that from June 1 the United Kingdom selling price of tin metal of minimum 99 per cent. up to under 99.75 per cent. tin content, would be increased from £519 to £569 per ton (f.o.b. U.K. port or delivered U.K. consumers' works). Other grades are correspondingly varied as follow:—Refined tin, 99.75 per cent. minimum, from £522 10s. to £572 10s.; refined tin, 99.9 per cent. minimum, in 28-lb. ingots, from £527 to £577; grain bar tin, from £539 to £589; granulated tin, from £544 to £594. The customary extras for small lots, packing, etc., will apply.

Drivers of Goods Vehicles

Need for Keeping Proper Records

The Traders' Road Transport Association draws attention to the fact that the law requiring drivers of goods vehicles to keep records has never been suspended and is, therefore, still in operation. Every driver concerned must carry with him on the vehicle a form on which to record the information required by law to be recorded. The record must be kept by the driver, and the required information entered thereon immediately that is possible.

It is important to note that the record must be kept currently up-to-date, and not, for example, entered up by the driver at the end of his day's work. The record form may cover either one day only or up to and not more than one week. On completion of the form, it must be handed to the licence-holder, who must hold it available for inspection by authorised persons for a period of at least three months. If a policeman has occasion to stop a goods vehicle it is usual for him in the first place to ask to see not only the driver's driving licence, but also his record sheet. If, then, certain items on the record sheet are not entered thereon and in accordance with the law should have been at that time, an offence has been committed.

For example, the driver may have had his statutory half-hour's rest period between, say, noon and 12.30 p.m., resuming his journey at that time. If he is stopped at 1 p.m. and the period of rest has not been entered by him on his record form, he has committed an offence. The licence-operator is required by law to ensure that these records are properly kept by his drivers, and if he fails so to do, is himself also liable.

M.O.S. Regional Office in North Wales

The rapid growth of industry in North Wales has led the Ministry of Supply to establish a North Wales Regional Office in Caernarvon. Most of the factories operating in the area have come into being since the war, and some of the concerns have taken over factories built by the Government during the war. Mr. Elias Williams, Assistant Regional Officer at Cardiff, has taken over the new office at Bryn Llwyd, St. David's Road, Caernarvon (telephone: Caernarvon 268).

Trade with Spain

An agreement has been negotiated with Spain on trade and payments between the two countries during the next 12 months. The arrangements provide for exports to the United Kingdom of essential supplies, including iron ore and pyrites. Exports from the United Kingdom will include coal, machinery, chemicals, and electrical goods. Spain has agreed to grant import licences for U.K. goods to a much greater extent than hitherto.

THE FREETH STREET SITE of the Darlington & Simpson Rolling Mills, Limited, at Oldbury, has been purchased by Cox & Danks, Limited.

Personal

MR. A. H. STRAND has been appointed secretary of the Burntisland Shipbuilding Company, Limited.

MR. R. E. JONES has been appointed an additional director of Warne, Wright & Rowland, Limited, bolt and nut manufacturers, of Birmingham.

MR. E. H. BALL, managing director of the British Thomson-Houston Company, Limited, has been elected a director of Associated Electrical Industries, Limited.

MR. R. KAGAN, head of the mechanical engineering department of Nottingham Technical College, has been appointed Principal of West Hartlepool Technical College.

MR. A. C. JOB, European sales manager of the Glacier Metal Company, Limited, is shortly to visit engineering works in Austria, Czechoslovakia, Switzerland, Belgium and Holland.

MR. R. CLELAND GOURLAY has received a presentation to mark his completion of 50 years' service on the board of A. F. Craig & Company, Limited, engineers, ironfounders, etc., of Paisley, Renfrewshire.

COL. R. B. EMERSON, who recently retired from the Chief Commissionership of Indian Railways, has been appointed deputy chairman of Dowsett Engineering Construction, Limited, Tallington, near Stamford.

MR. JAMES F. LINCOLN, president of the Lincoln Electric Company, Cleveland, Ohio (associated with the Lincoln Electric Company, Limited, Welwyn Garden City, Herts), is visiting this country at the end of this month.

MR. D. PATERSON, production engineer of the Carron Company, engineers, ironfounders, etc., of Falkirk, who has taken up an appointment with the Logan Mining Machinery Company, Limited, Dundee, has received a presentation to mark the occasion.

MR. F. WARDROBE, who has retired from his position as chief engineer of William Jessop & Sons, Limited, steelmakers, etc., of Sheffield, retains his seat on the board. He will also continue to act as consultant to the company on plant and engineering developments.

MR. CHARLES CONNELL, managing director of Charles Connell & Company, Limited, engineers and shipbuilders, of Scotstoun, Glasgow, has been appointed to the board of the Iron Trades Employers' Insurance Association, Limited, and of its subsidiary, Iron Trades Mutual Insurance Company, Limited.

SIR FREDERICK BAIN, president of the Federation of British Industries, last week spoke at the Canadian Manufacturers' Association's annual general meeting dinner at Toronto. He also attended the official opening of the Canadian International Trade Fair at Toronto. After a fortnight in Canada, Sir Frederick will visit Washington.

MR. E. W. SANGER is relinquishing his position as general sales manager of the Birmingham Aluminium Casting (1903) Company, Limited, Smethwick, to take up an appointment as joint managing director of Begwaco Meters, Limited, Farnworth, Lancs. Mr. Sanger will be succeeded by MR. W. J. PRICE, formerly sales engineer of the Smethwick company.

MR. H. C. BUSTARD, general manager of the Mercantile Dry Dock Company, Limited, Jarrow, and MR. P. GIFFORD, a director of D. & W. Henderson, Limited, Glasgow, have been elected members of the Technical Committee of the British Corporation Register of Shipping and Aircraft and as representatives of the Dry Dock Owners' and Repairers' Central Council.

DR. ZYGMUNT ZBICHORSKI, Professor of Organisation and Management at the Adelberg State Engineering School, who is in Britain until June 11 under the auspices of the British Council, is adviser to the Polish Ministry of Industry and Commerce on industrial administration and secretary of the Council of the Scientific Institute of Organisation and Management. He is here to study the organisation of institutes of industrial administration, departments of industrial administration and technical colleges, and factories engaged in the metal industry. After visiting Glasgow, Birmingham, and Sheffield, Dr. Zbichorski will return to London, where his programme will include visits to technical colleges, the British Institute of Management, the Federation of British Industries, the Trades Union Congress, the Institute of Production Engineers, and the Institute of Industrial Administration.

Wills

DORMER, H. A., chairman of the Sheffield Twist Drill & Steel Company, Limited	£517,632
HARGREAVES, HERBERT, a director of Hargreaves & Jennings, Limited, ironfounders, of Bury	£21,710
WOODS, E. J., of C. & W. Walker, Limited, gasworks engineers and ironfounders, of Wellington ...	£4,132
HIBBERT, LT.-COL. A., general manager of the Millom & Askam Hematite Iron Company, Limited, Cumberland, and a director of the North Lonsdale Iron & Steel Company, Limited	£28,212

New Capital Proposed for Crompton Parkinson

Crompton Parkinson, Limited, is to increase the "A" ordinary capital from £1,150,000 to £2,000,000 and to issue 1,025,932 "A" ordinary shares of 5s. each at 20s. per share to ordinary and "A" ordinary stockholders on the register on May 14 in the proportion of one new for every five stock units held. The new shares will not rank for any interim dividend on account of the year ending September 30, 1948.

The directors state that it has been their policy in the past to finance normal expansion out of the company's resources, but the continued and continuing rise in costs has caused a recent review of the situation. To finance the programme of re-equipment and expansion, both as regards production facilities and working capital, will require something over £1½ million, much of which will be required in 1948 and almost all of which will be required by the end of 1949.

Steps to Raise Steel Production in Europe

Overcoming Scrap and Ore Shortages

A number of significant steps were taken recently in Geneva to increase European steel production. The United Nations Economic Commission for Europe's Steel Committee arrived at these steps after three days of probing into the problems which are retarding steel output.

Agreement was reached upon the principle to be applied in the international distribution of metallurgical coke for iron and steel making.

An appeal was made to countries exporting steel-making equipment to take measures to improve the availabilities of such equipment to European steel industries.

The position regarding the shortage of rich iron ores was surveyed and the Committee recommended that producing countries "make all possible efforts to increase still further the quantities of rich ores placed at the disposal of European countries." In view of the probable shortage of manganese ore in 1949, it was recommended that all ores suitable for the production of ferro-manganese "should be kept by priority for that use and not employed for the production of pig-iron."

The Steel Committee agreed to the establishment of a panel of experts on scrap. This panel will meet soon to draw up its programme, but it can already be predicted that the panel will visit various countries to exchange information on the best methods of collecting and preparing scrap as a means to increasing steel production while economising in coke consumption. The Committee supported the recommendation of a U.S. Scrap Mission to Germany—that the scrap export possibilities of Germany be exploited to the maximum for the benefit of countries in need of scrap.

While the coke and scrap situations may improve gradually, it is feared that the deficit in rich iron ores will increase in 1949 and 1950. The expected 1949 deficit in supplies is 5.5 million tons. To meet the situation, the Committee recommended that main producing countries make every effort to increase the quantities of rich ores placed at the disposal of European countries. In this connection, the Swedish delegate stated that any increase in Swedish production and export of ores was conditional upon early delivery of equipment ordered in the U.S.A. and the United Kingdom. The U.S. representative's promise that he would bring this matter to the attention of his Government was noted "with satisfaction."

Fifteen European countries, plus the Union of South Africa and the United States of America, sent representatives to the Steel Committee's session. Mr. P. R. Bentz van den Berg, Director-General of the Royal Dutch Iron and Steel Works, was elected chairman of the Committee.

STEEL & COMPANY, LIMITED, Sunderland, has received an order for mobile cranes from a company in the Faroe Islands.

G.K.N. Plans for Possible Nationalisation

Formation of Holding Company

The directors of Guest, Keen & Nettlefolds, Limited, propose to increase the authorised capital of the company by £3,000,000 to £23,000,000 by the creation of a new class of preference shares. It is their intention to simplify the structure of the company, and they propose to make it entirely a holding company and to carry on the operative parts of the undertaking through separate subsidiary companies. This decision has been taken in view of the possible nationalisation of the iron and steel industry.

To effect this policy it will be necessary to redeem the outstanding £1,079,450 of 4 per cent. mortgage debenture stock and, as already announced, it is intended to repay the debenture stock at 102 per cent. in cash with an option to holders to convert into the new 4½ per cent. third cumulative preference shares.

A scheme of arrangement to this end has been prepared and a meeting of stockholders ordered by the Court. The meeting will be held on June 15, and on the same day an extraordinary meeting will be held to consider the proposed increase in authorised capital and creation of £3,000,000 of 4½ per cent. third cumulative preference shares of £1 each. C.I.C. consent has been obtained to the issue of 1,100,000 of the new preference for cash to obtain funds to provide for the redemption of debenture stock or to debenture stockholders to satisfy conversion rights.

I.C.I. Ordinary Shares Issue

Lord McGowan, chairman of Imperial Chemical Industries, Limited, announced at the annual meeting that application had been made to the Capital Issues Committee for permission to make a new issue of ordinary shares to the company's ordinary stockholders. The offer which is of one new share for every five held, while in the first place to ordinary stockholders, will be available to preference stockholders to the extent that the initial rights remain unexercised.

In his recent statement circulated with the annual report, Lord McGowan pointed out that the capital expenditure programme of I.C.I. was a heavy one and that it extended into the future to a figure much beyond the commitments noted on the balance-sheet as being approximately £15,500,000. He added that the means of financing the further large expansion was receiving the consideration of the board.

MR. DOUGLAS JAY, Economic Secretary to the Treasury, visiting North-East Coast shipyards, stated that the Government regarded the shipbuilding industry as of the utmost economic importance. It was taking steps to ensure that the yards got their fair share of steel. Fears of heavy unemployment in the industry in the future were, he added, greatly exaggerated.

News in Brief

THE NAME OF G. N. Ainsworth & G. O. Stevenson, Limited, manufacturers of engineering supplies, of Manchester, has been changed to Ainsworth & Stevenson, Limited.

SIGMUND PUMPS, LIMITED, Gateshead, announces that it received orders at the Birmingham section of the British Industries Fair totalling some £70,000—almost entirely for export.

THE JOINERS' SHED and patternshop of Ritchie, Hart & Company, Limited, engineers and foundrymen, of Belfast, were destroyed by fire last week. The main buildings were saved.

A SUGGESTION THAT additional capital may be raised is made by the directors of the Hoffmann Manufacturing Company, Limited, makers of ball and roller bearings, of Chelmsford, in their report for 1947.

IN A NOTE on the outbreak of a fire at the works of E. S. Lord, Limited, of Rochdale, a misprint occurred and Rochester was given instead of Rochdale. We apologise for any inconvenience caused.

ALMEX RECOVERY & REFINING COMPANY, LIMITED, steel and metal stock holders, etc., of Robert Street, London, W.C.2, has changed its name to "Alreco" The Almex Recovery & Refining Company, Limited.

A WELL-KNOWN Black Country landmark, the 178-ft. brick-built chimney stack at Station Fields, Tipton, which belonged to William Roberts, Limited, whose blast furnaces were closed down in 1921, has been felled.

PLANS FOR an apprentices' school, including a workshop with equipment for pattern making, moulding, fabricating, etc., at the Davy & United Engineering Company, Limited, Sheffield, have been approved by the City Council.

THE RECEIVING DEPARTMENTS of the Hartford Works, Werneth, and the Hartford Works, East Oldham, of Platt Bros. & Company, Limited, will be closed for the receipt of goods from June 19 to June 26, the period of the Wakes holidays.

THE MINISTRY OF SUPPLY announces that the cost to the British Iron & Steel Corporation (Ore), Limited, of manganese ore for the manufacture of blast-furnace ferro-manganese has increased to 25d. per unit, with effect from May 10, 1948.

WORKERS OF the Consett Iron Company, Limited, have increased their National Savings investments in six months by nearly £3,000, while an even bigger increase—£7,000—has been achieved by the employees of Dorman, Long & Company, Limited.

COSTAIN-JOHN BROWN, LIMITED, has been registered as a private company with a nominal capital of £100 in £1 shares. The company is to undertake constructional and mechanical engineering work, primarily in connection with industrial undertakings.

THE LINK-UP between the Associated Equipment Company, Limited, and the Maudslay Motor Company, Limited, may now be regarded as an accomplished fact, since the holders of more than 90 per cent. of Maudslay ordinary shares have accepted the A.E.C. offer.

CHIRNSIDE & COMPANY, suppliers of foundry requisites, etc., of Warwick, announce that, consequent upon the recent death of Mr. R. Chirnside, the business and offices of the company have been transferred to 9, Midland Road, Wellingborough, as from Tuesday last.

APPLICATION HAS BEEN MADE by the Admiralty for the steelfoundry at Portsmouth Dockyard to be placed in Lloyd's Register's list of approved steel manufacturers. At present no Admiralty establishments are included in the Society's list of approved manufacturers.

WITH THE OBJECT of speeding up the delivery of hot metal, three miles of double railway track are being laid by Dorman, Long & Company, Limited, between its Cleveland and Redcar iron and steel plants. This also involves the building of a 360-ft. bridge with five main spans.

IMPORTS OF PIG-IRON into Eire in March totalled 742 tons, the value being £16,480, against 550 tons (£8,053) in March, 1947. Other imports were:—Iron bars and rods, 30 tons (£1,033), against 20 tons (£838); steel bars and rods, 1,183 tons (£51,753), against 548 tons (£15,314); iron and steel squares and flats, 1,176 tons (£44,328), against 214 tons (£7,261).

SPEAKING AT A luncheon given by the General Purposes Committee of the City Council to the members of the Chamber of Commerce Fair Management Committee to mark the happy relationship between the Corporation and the Chamber of Commerce, Alderman A. F. Bradbeer, chairman of the General Purposes Committee, suggested the establishment of a Birmingham Council of Industry and the appointment of a customs official at Elmdon Airport to enable direct air transport between Birmingham and the Continent. He described this year's British Industries Fair at Castle Bromwich as the greatest that had been held, and said its future should be viewed as a continually expanding process.

U.K. Trade Adviser in U.S

Mr. Neville Blond has accepted the invitation of the Board of Trade to occupy a specially created post of United Kingdom trade adviser in the United States. He is 53 years of age and became a temporary civil servant six years ago. Mr. Blond was first with the Ministry of Production, then at the Board of Trade and for six months was on Sir Edwin Plowden's planning staff, without salary. He is the senior partner in a firm of Manchester textile manufacturers.

In his new position Mr. Blond will work in close co-operation with the Minister Commercial in Washington and with U.K. consular officers. His function will be the promotion of British export trade and it is expected that he will travel widely throughout the United States in search of new openings for U.K. goods.

Obituary

MR. JOHN WALLACE, of A. & J. Main & Company, Limited, structural engineers, of Glasgow, died suddenly on May 22.

MR. ALFRED FYNES COCKING, secretary of the Union Grinding Wheel Company, Sheffield, for the past 50 years, died recently after a short illness.

MR. FRANK WALLERS, a director of Mather & Platt, Limited, textile engineers, etc., of Newton Heath, Manchester, has died suddenly at the age of 71.

MR. CYRUS BRABY, formerly chairman of Frederick Braby & Company, Limited, structural engineers, etc., of Euston Road, London, N.W.1, died suddenly on May 20. He was 80 years of age.

MR. DANIEL REGINALD LEWIS, works manager at Bayliss, Jones & Bayliss, Limited, iron and steel rollers, etc., of Wolverhampton, has died at the age of 61. He had served on the British Standards Committee for Bolts and Nuts.

MR. HAROLD LAMBERT, who died at Scarborough on May 22, aged 86, resigned a few days earlier from the directorate of Hudswell, Clarke & Company, Limited, locomotive builders, of Hunslet, Leeds. He joined the firm in a minor capacity, became a director five years later, and 16 years afterwards was appointed chairman of the company.

PROF. W. T. DAVID, Professor of Mechanical Engineering at Leeds University, died on May 22 at the age of 62. He studied engineering at the University College of South Wales and Monmouthshire, Cardiff, and at Trinity College, Cambridge, where he started research in combustion of gases. In 1920 he was appointed to the chair of engineering at Cardiff, and two years later took up a similar position at Leeds. He was a past-chairman of the Yorkshire Association of Civil Engineers.

SIR WILLIAM MURRAY MORRISON, a former deputy chairman of the British Aluminium Company, Limited, has died in London. He had been connected with the company since its formation in 1910, when he was appointed general manager. In 1927 he was elected a director, became managing director in 1930, and was appointed deputy chairman in 1934. He retired from the board two years ago. Sir William, who was born in 1873, was a pioneer of aluminium production in Britain. At the time of his death he was on the boards of several companies, including the North British Aluminium Company, Limited, and James Booth & Company, Limited, Birmingham.

LORD CITRINE, Chairman of the British Electricity Authority, performed the opening ceremony at the extension of the power house at the Renishaw Ironworks, Sheffield, on May 26. The new plant, comprising a 1,000 k.w. turbo-alternator set, will enable electricity generated from waste furnace gases to be supplied to the Grid and effect an annual saving of some 5,000 tons of coal.

English Electric's Commonwealth Developments

Utilising Company's Resources

Sir George Nelson, chairman and managing director of the English Electric Company, Limited, has returned from his visit to South Africa and the Rhodesias. In South Africa, he was present at the opening in April of a new works established by the company's wholly owned South African subsidiary at Benoni where mine exhaustion is making labour available with established housing. Production at Benoni consists of electric motors and transformers and, although on a comparatively small scale to begin with, is regarded by Sir George as an earnest of English Electric's closer entry into Commonwealth development.

At a Press conference on his return Sir George said that the English Electric Company was using only 65 per cent. of its productive capacity because it was not getting the necessary labour and materials. The greatest shortage was in the supply of special electric steel. The company had immense resources in the shape of its research, technical knowledge and experience, and it was the policy of the board to make these valuable assets available in the various branches of the Commonwealth.

It was felt that the development of those countries would bring a demand to Britain for heavy machinery which it was not practicable to erect overseas.

Festival of Britain 1951

Scottish Committee Appointed

The personnel of the Council which will supervise the Festival of Britain 1951 was announced recently. Mr. Arthur Woodburn, M.P., Secretary of State for Scotland, has now announced that a Scottish Committee has been appointed to co-ordinate the arrangements in Scotland for the Festival. The members are:—

Mr. Joseph Westwood, P.C., M.P. (chairman); Sir Steven Bilsland, chairman of the Scottish Council (Development and Industry), and of the Scottish Committee of the Council of Industrial Design; Lady Dollan; Col. Walter Elliot, P.C., M.P.; Miss M. Herbison, M.P.; Sir Hector Hetherington, Principal and Vice-Chancellor, Glasgow University; Sir Alexander B. King; Mr. Eric Linklater; Mr. A. B. Mackay; Sir Hector McNeill, Lord Provost of Glasgow; Sir Frank C. Mears, president of the Royal Scottish Academy; Mr. A. H. A. Murray, Lord Provost of Edinburgh; Sir Frederick Stewart, past-president, Institute of Engineers and Shipbuilders in Scotland; Dr. James Welsh; Mr. H. Harvey Wood, Scottish representative of the British Council and chairman of the Programme Committee of the Edinburgh Festival; Mr. W. M. Ballantine, director, Scottish Information Office.

Mr. Westwood, Col. Elliot, Miss Herbison, and Sir Frederick Stewart will also serve on the Council of the Festival of Britain and represent the views of the Scottish Committee to that body.

Company News

(Figures for previous year in brackets.)

Veritys—Dividend of 5% (2½%).

Franco Signs—Dividend of 5% (10%).

Sheffield Steel Products—Dividend of 15% (same).

Armstrong, Stevens & Son—Dividend of 20% (same).

Howard & Bullough (Securities)—Dividend of 5%.

J. Brockhouse & Company—Interim dividend of 7½% (same).

Arthur Lee & Sons—Interim dividend of 15% (same).

Siemens Bros. & Company—Dividend of 7½% (same).

Ward & Goldstone—Final dividend of 30%, making 50% (same).

Broom & Wade—Interim dividend of 7½% on larger capital (7½%).

Trojan (Holdings)—No interim ordinary dividend (nil for 1946-47).

Associated Equipment Company—Interim dividend of 5%, tax free (same).

Lightfoot Refrigeration Company—Final dividend of 5%, making 8% (same).

Ambrose Shardlow & Company—Final dividend of 10%, making 12½% (same).

Eva Bros.—Final dividend of 42%, making 70%. The company was made public in July, 1947.

Mountstuart Dry Docks—Dividend of 8% on the preferred shares (same) and of 10⅔% on the deferred shares.

S.G.B. (Dudley)—Payment of a half-year's dividend to June 30, 1948, on the 6% cumulative preference shares.

Cowlishaw, Walker & Company—Net profit for 1947, after taxation, etc., £29,971; to general reserve £75,000; forward, £61 (£45,089).

Prior Stokers—Profit for 1947, £13,118 (£12,040); to tax, £6,500 (£5,685); dividend of 10% (same); general reserve, £2,500 (£2,500); forward, £5,102 (£3,465).

Stancroft—Dividend of 37½% in respect of the nine months ended March 31—equivalent to 50% in a full year. The company was made public on January 7, 1948.

W. H. Baxter—Net profit for the year ended March 31, after tax, depreciation, etc., £19,637 (£8,764); dividend of 20% (same); written off goodwill, £10,000 (nil); forward, £3,103 (£1,606).

Automatic Telephone & Electric Company—Final ordinary dividend of 7% and bonus of 2½%, making 12½% (same); dividend of 10% and bonus of 2½% on the deferred stock (same).

Metropolitan Electric Cable & Construction Company—Net profit for 1947, £121,124 (£77,624); to taxation, £66,500 (£53,000); deferred repairs, nil (£2,500); dividend of 15% (same); forward, £114,985 (£65,311).

Jury Holloware (Stevens)—Trading profit to March 31, after tax, £35,749 (£29,946); fees, £45 (£91); to depreciation, £6,000 (same); dividend of 10% (same); general reserve, £10,000 (same); forward, £30,044 (£22,900).

Trussed Concrete Steel Company—Trading profit for 1947, £37,330 (£17,330); amount available, after depreciation, tax, etc., and including £15,235 brought in, £25,367, which the directors recommend should be carried forward; no ordinary dividend (same).

G. & J. Weir—Profit for 1947, after making provision for a loss sustained by a subsidiary, £453,827 (£410,809); to taxation, £288,775 (£168,312); final dividend of 30%, making 40% (same); to general reserve, nil (£100,000); forward, £256,582 (£239,539).

Peglers—Net profit for the year ended March 31, after depreciation, tax, etc., £156,144 (£73,315); to general reserve, £55,000 (£25,000); stock reserve, £25,000 (nil), dividend equalisation reserve, £30,000 (nil); dividend of 45% (same); forward, £28,640 (£26,278).

Robey & Company—Trading profit for 1947, £40,425 (£54,182); interest, etc., £266 (£365); to debenture holders trustees' fees, £61 (£63); directors' fees, £750 (same); depreciation, £13,016 (£12,830); balance, £26,864 (£40,904); to taxation, £12,000; dividend of 10% (same); forward, £24,858 (£23,043).

Heatrae—Net profit for the year ended February 29, after depreciation, tax, etc., £22,693 (£11,656); dividend of 12½% (same); general reserve, £7,000 (£1,500); stock reserve, £5,000 (nil); deferred repairs reserve, £3,000 (nil); reduction of book value of plant and machinery to nominal figure of £1, nil (£2,325); forward, £7,380 (£7,437).

W. E. Hughes & Company—Net profit for 1947, £102,855 (£53,414, plus £2,800 preference redemption reserve); to tax, £54,661 (£29,446); capital reserve, £18,319 (£12,392); general reserve, £5,000 (£1,500); preference dividend, £3,300 (£2,181); final ordinary dividend of 30%, making 40% (25%); forward, £6,007 (£2,307).

Burntisland Shipbuilding Company—Profit for the year ended March 31, after profits tax, £160,136 (£84,758); to depreciation, £9,204 (£9,129); reserve, £20,000 (£15,000); reserve for income tax, £61,500 (£33,000); pension fund, £10,000 (same); final dividend of 15%, making 20% (same); forward, £86,554 (£43,622).

F. Francis & Sons—Trading profit for 1947, £90,181 (£88,354); subsidiary dividends, £13,750 (£8,250); to directors' fees, £1,150 (£1,000); depreciation, £8,091 (£7,424); net profit, £94,690 (£88,180); to tax, £48,000 (£50,000); capital issue expenses, £1,003 (nil); general reserve, £25,000 (nil); final dividend of 15%, making 20% (same); forward, £20,387 (£30,500).

Expert Tool & Case Hardening Company—Net trading profit for 1947, including subsidiary dividends, £74,609 (£71,849); to directors' fees, £900 (same); net

profit, £73,709 (£70,949); to tax, £33,847 (£42,881); preference redemption fund, £1,050 (nil); general reserve, £20,000 (£6,500); final dividend of 25%, making 40% (same); forward, £10,876 (£10,654).

Aluminium Corpofation—Trading profit for 1947, after depreciation, £86,841 (£61,698 after E.P.T.); profit on sale of trade investments, £4,146; balance, after directors' remuneration, taxation, etc., £37,430; to reserve, £10,000 (£15,000); reserve towards debenture redemption premium, £10,000 (nil); dividend of 10% (same) on ordinary and "A" ordinary; forward, £13,305 (£5,225).

Mellowes & Company—Profit for 1947, £94,809 (£76,602); transfer from war contingencies, £45,000 (nil); to directors' bonus, £1,918 (£1,957); tax, £57,000 (£36,000); pensions, £20,000 (£2,500); reserve for loss on realisation Government securities, less profit on sale other securities, £30,604 (nil); final dividend of 10% and bonus 10%, making 30% (same); forward, £18,902 (£18,865).

Platt Bros. (Holdings)—Dividends from subsidiaries to March 31, £134,092 (£88,578); other income, £58,459 (£63,821); to expenses, £1,586 (£4,449); depreciation, £440 (£230); debenture interest, £11,358 (same); directors' remuneration, £3,750 (£4,063); past directors' pensions, £750 (£563); leaving, £174,667 (£131,737); dividend of 10% (same); to reserve, £80,000 (£33,755); forward, £27,957 (£25,477).

British Thermostat Company—Net profit for the year ended January 31, after depreciation, etc., £191,284 (£130,031); to taxation, £100,000 (£88,000); preference issue expenses, nil (£542); patents written off, £7,999 (nil); premium on acquisition shares in Packless Gland Company written off, £1,360 (nil); reserve, £35,000 (nil); final dividend of 11% and bonus of 5%, making 23½% (same); forward, £72,282 (£47,219).

Craven Bros. (Manchester)—Profit for 1947, £55,626 (£64,044); tax refund, nil (£30,000); to bank interest and charges, £1,250 (£2,265); deferred repairs, nil (£6,105); depreciation, £15,000 (same); tax, £8,000 (£27,000); net profit, £31,376 (£43,674); to preference dividend, £4,125 (nil); final ordinary dividend of 10% (15%), making 15% (20%); directors' fees, £2,100 (same); forward, £184,907 (£184,506).

Skinningrove Iron Company—Profit to March 31, £432,792 (£295,248); to depreciation, £100,000 (£50,000); taxation, £220,000 (£146,000); renewals, relinings and repairs, £25,000 (£70,00); long-service fund, £15,000 (nil); supplementary pensions, £5,000 (nil); general reserve, £30,000 (nil); preference dividend, £6,776 (nil); ordinary dividend of 5% (nil); forward, £30,487 (£15,971 after debenture interest).

Pressed Steel Company—Trading balance for 1947, £1,118,512 (£1,015,920); transfer fees, £289 (£309); interest, £688 (nil); to depreciation, £276,363 (£259,254); debenture interest, £10,440 (£10,950); debenture trustees' fees, £21 (same); tax, £468,000 (£434,000); registration expenses, £2,203 (£2,017); directors' fees, £6,472 (£5,440); interest, nil (£542); contingencies, £50,000 (same); leaving, £305,990 (£254,005); final dividend of 20%, making 30% (same); forward, £770,278 (£617,178).

Hopkinsons—Trading profit for the year ended January 31, £304,884 (£239,763); dividends and interest, £5,474 (£7,188); transfer fees, £58 (£68); to depreciation, £33,210 (£32,463); profit on sales and scrapping of assets, £1,105 (£1,031); to directors' fees, £32,105 (£31,432); audit fee and expenses, £483 (£340); net profit, £276,078 (£213,497); to taxation, less £3,415 previously overprovided, £141,786 (£96,000); general reserve, £50,000 (same); final dividend of 15%, making 22½% (same); forward, £156,832 (£129,327).

Chloride Electrical Storage Company—Profit for the nine months ended December 31 last (including 12 months for subsidiary companies), £1,108,821; tax, £850,000; to general reserve, £100,000; pensions, £25,000; forward, after preference and ordinary dividends, £222,626 (£213,847). A dividend of 5% on the ordinary shares was paid on December 1, 1947, and a dividend of 5% and a bonus of 10% on May 19, 1948. Profit for the year ended March 31, 1947, after E.P.T. and including £10,873 from a subsidiary, was £772,303.

Wilkes Berger Engineering Company—Group accounts for 1947 (13 months for subsidiary) show net profit £82,092 (£60,678 previous year); interest on war damage claim, £2,468 (nil); to taxation, £52,400 (£40,129); directors' fees, £200 (same); preference redemption reserve, £4,150 (£3,950); preference dividend, £1,074 (£1,191); ordinary dividend of 20% (15% and bonus of 5%); forward, £59,590 (£42,754). The directors also recommend cash distribution to ordinary-share holders out of capital reserve, of 5%, not subject to tax.

Hoffmann Manufacturing Company—Trading profit for 1947, £525,755 (£144,963); dividends received, £15,167 (£6,873); transfer fees, £81 (£102); European debts recovered, £974 (£6,054); to directors' fees, £4,345 (£5,034); depreciation, £99,437 (£70,735); pension funds, £24,290 (£24,157); debenture trustees' fees, £158 (same); auditors' remuneration, £852 (£825); legal and professional expenses, £334 (£2,394); tax, £170,000 (£30,000); profit, £242,561 (£24,689); E.P.T., etc., recoveries, nil (£140,000); to debenture interest, £5,870 (£6,097); preference dividend, £20,625 (same); special depreciation and obsolescence, £120,000 (£100,000); ordinary dividend of 7½%, free of tax (same); general reserve, £33,615 (£37,500); forward, £145,340 (£120,389).

Briggs Motor Bodies—Trading profit for 1947, after expenses, depreciation, additional provisions for E.P.T., and deferred repairs, provision for profits tax and contingencies and reserve for possible fall in commodity prices, £859,430 (£518,851); to directors' fees, £3,511 (£3,200); debenture stock trustees, £473 (£500); transfer office expenses, etc., £2,801 (£1,949); pensions, £24,547 (£22,278); Briggs' Trust loan account interest, £1,800 (£7,200); debenture interest, £25,200 (£38,499); debenture sinking fund, nil (£21,451); debenture redemption premium, £50,161 (nil); income tax, £385,272 (£245,941); income tax on deferred repairs provisions in previous years, £147,656 (nil); net profit, £218,009 (£177,833); ordinary dividend of 12½% (10%); employees' recreational facilities reserve, £50,000 (nil); general reserve, £50,000 (£125,000); forward, £103,573 (£54,314).

Imports and Exports of Iron and Steel

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in April, and the first four months of 1948. Figures for the corresponding period of 1938 are given for purposes of comparison.

Total Exports of Iron and Steel

Destination.	April, 1948.	Four months ended April.	One-third of 1938.
	Tons.	Tons.	Tons.
Eire	6,353	24,351	18,573
Channel Islands	987	3,325	2,472
Gibraltar	369	1,336	294
Malta and Gozo	451	1,361	768
Cyprus	352	1,344	552
Palestine	2,523	9,211	2,690
British West Africa	3,756	15,537	16,581
Union of South Africa	12,163	48,017	77,029
Northern Rhodesia	901	2,143	6,858
Southern Rhodesia	1,698	4,992	12,071
British East Africa	4,526	21,113	8,644
Bahrein, Kuwait, Qatar and Trucial Oman	3,207	12,532	*
India, Pakistan, etc.	10,109	25,262	52,892
British Malaya	2,828	8,891	22,195
Ceylon	1,052	3,579	8,677
North Borneo	165	2,660	38
Hong Kong	3,178	9,315	7,865
Australia	6,884	23,408	50,968
New Zealand	3,653	20,735	43,961
Canada	700	5,077	28,470
British West Indies	1,654	9,945	14,750
British Guiana	699	1,539	999
Anglo-Egyptian Sudan	1,063	3,790	2,763
Other British countries	1,944	5,315	4,654
Russia	5,077	9,041	1,450
Finland	5,420	21,518	5,869
Sweden	10,075	36,060	3,991
Norway	4,180	16,832	6,758
Iceland	309	1,194	219
Denmark	5,532	24,805	29,085
Poland	462	658	829
Netherlands	5,179	27,089	17,186
Belgium	1,139	4,506	6,775
France	945	4,222	4,462
Switzerland	1,790	5,980	927
Portugal	1,652	11,269	2,571
Spain	265	2,017	2,588
Italy	650	1,269	1,713
Hungary	23	62	11
Czechoslovakia	65	172	772
Greece	294	1,231	584
Turkey	2,611	6,139	4,586
Dutch East Indies	1,038	7,246	9,102
Dutch West India Islands	981	2,771	821
Belgian Congo	203	487	101
Algeria	10	253	17
Portuguese East Africa	92	864	4,740
Syria	58	256	869
Lebanon	350	1,427	
Egypt	4,417	17,158	11,470
Iraq	4,086	14,756	8,580
Iran	8,593	35,052	36,793
Burma	1,052	9,753	6,171
Siam (Thailand)	197	928	1,999
China	788	9,266	7,503
U.S.A.	117	707	729
Cuba	81	703	241
Colombia	689	2,806	1,274
Venezuela	3,390	18,359	1,558
Ecuador	20	1,093	531
Peru	253	1,389	1,010
Chile	750	2,905	2,098
Brazil	3,385	7,042	5,663
Uruguay	636	2,960	2,529
Argentine	6,562	26,595	26,452
Other foreign countries	2,381	10,419	27,234
Total	157,012	614,037	638,625

*Included in "Other British countries" and "Other foreign countries."

Total Imports of Iron and Steel

From	April, 1948.	Four months ended April.	One-third of 1938.
	Tons.	Tons.	Tons.
Australia	305	8,846	12
Canada	7,636	22,611	39,125
Other British countries	1,990	2,324	53,744
Sweden	1,524	5,493	29,932
Norway	3,628	10,043	11,258
Germany	516	773	32,000
Belgium	12,642	32,162	91,227
Luxemburg	1,205	2,633	19,534
U.S.A.	11,162	51,286	66,897
Other foreign countries	629	4,900	104,362
Total	41,237	141,071	448,090
Iron ore and concentrates—			
Manganiferous	—	—	20,761
Other sorts	774,813	2,721,726	1,700,623
Iron and steel scrap and waste, fit only for the recovery of metal	54,008	171,148	210,734

Exports of Iron and Steel by Products

Product.	April, 1948.	Four months ended April.	One-third of 1938.
	Tons.	Tons.	Tons.
Pig-iron	73	231	31,314
Ferro-alloys, etc.—			
Ferro-tungsten	65	321	172
Spiegeleisen, ferro-manganese	58	2,278	1,732
All other descriptions*	62	232	349
Ingots, blooms, billets and slabs	632	1,752	3,248
Iron bars and rods	372	1,491	1,066
Sheet and tinplate bars, wire rods	272	1,252	5,187
Bright-steel bars	2,188	8,646	2,196
Other steel bars and rods	7,981	36,431	34,000
Special steel	1,800	6,752	1,644
Angles, shapes and sections	6,681	28,032	22,291
Castings and forgings	546	2,206	539
Girders, beams, joists and pillars	2,127	7,831	11,157
Hoop and strip	3,185	12,476	12,459
Plates ⅛ in. thick and over	10,585	40,373	43,653
Black plates	5,432	21,606	4,846
Black sheets	2,701	9,133	21,170
Galvanised sheets	6,278	22,231	48,978
Tinplates	19,335	65,614	106,436
Tinned sheets	279	1,395	470
Terneplates	52	85	1,442
Decorated tinplates	106	337	1,456
Other coated plates	351	1,211	75
Cast-iron pipes, up to 6-in. dia.	3,601	19,906	16,309
Do., over 6-in. dia.	5,340	15,569	14,321
Wrought-iron tubes	20,585	98,143	73,324
Radiators and central-heating boilers	315	1,205	1,343
Railway material	18,154	53,379	52,718
Wire	3,335	13,012	18,394
Cable and rope	2,218	8,742	5,487
Netting, fencing and mesh	1,113	5,672	3,139
Other wire manufactures	583	2,300	1,224
Nails, tacks, etc.	420	2,004	1,269
Rivets and washers	589	2,603	2,845
Wood screws	406	1,844	837
Bolts, nuts and metal screws	1,684	6,801	5,858
Stoves, grates, etc. (excl. gas)	907	3,952	2,335
Do., gas	231	1,001	715
Sanitary cisterns	138	486	937
Fencing material	206	1,151	1,710
Anchors, etc.	933	3,152	2,112
Chains, etc.	853	3,080	2,097
Springs	707	1,984	1,310
Hollow-ware	5,474	24,510	3,568
All other manufactures	18,059	71,625	70,913
	157,012	614,037	638,625

* The figures for 1938 are not completely comparable with those for subsequent years.